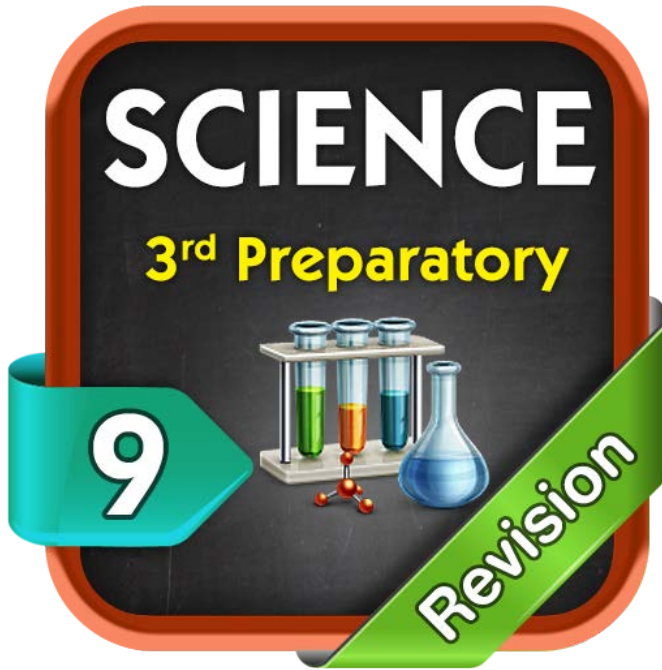


2023



Mister: Abdou Elmorshedy

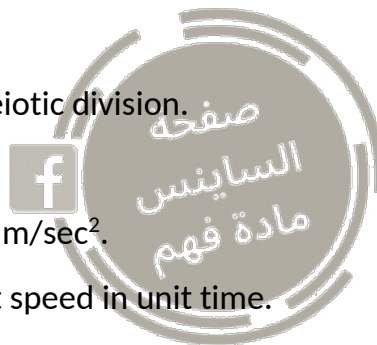


① Write the scientific term :

1. The speed of a moving body relative to an observer where he is fixed or movable.
 - The value of an object's speed relative to the observer.
2. It is the distance moved through a unit time.
 - The distance covered per unit time.
 - The covered distance at a certain direction.
3. A phase in which some important vital processes occur to prepare the cell for division and the genetic material in the cell is doubled.
4. The physical quantity that has magnitude only and it has no direction.
5. The physical quantity that its magnitude and direction are necessary for identifying it completely.
6. The space which contains all galaxies, stars, planets, moons and living organisms.
 - It is a wide and extended space that contains galaxies.
7. It is a transparent medium that refracts the light and is defined with two spherical surfaces.
8. It is the length of the shortest straight line between two positions.
9. The point at which the rays which incident parallel to each other and parallel to the principal axis of the concave mirror are collected.
10. Asexual reproduction occurs by using plant organs except seeds.
11. The image that can't be formed on a screen.
12. A flat gaseous round disk that formed the solar system.
 - A glowing gaseous sphere revolving around itself that formed the solar system.
 - A round disk assumed that it is the source of formation of the solar system.
13. Any straight line that passes by the center of curvature of the mirror and any point on its surface except the pole of mirror.
14. The total distance that a moving object covers divided by the total time taken to cover this distance.
15. The ability of some animals to compensate their missing parts.
16. The straight line that passes by the pole of the mirror and its center of curvature.
 - It is the straight line that joins between the two centers of curvature of the lens passing by the optical center of the lens.
 - The line joins the center of curvature of the lens and its optical center.
17. The nuclear acid that carries the genetic traits of the multicellular living organism.

18. The force that keeps the continuity of the planets rotation in their orbits around the Sun.
19. Chemically, it consists of nuclear acid DNA and protein.
- It consists of two chromatids connected together at centromere.
20. A mirror forms laterally inverted and equal in size image for an object.
21. The largest star that can be seen clearly by people on the Earth.
22. The bouncing of the incident light ray in the same medium when it strikes a reflecting surface.
23. A process in which some pieces of the two inner chromatids of tetrad are exchanged.
- It occurs at the end of the first prophase of the meiosis, in which the inner parts of chromatids are exchanged.
24. A disease in which the eye lens becomes opaque.
25. The angle of incidence = the angle of reflection.
26. The unit which is used for measuring the distance between celestial bodies.
- The distance that light travels in a year.
27. Theory explain that the universe emerged from a massive explosion since 15000 million years.
- Theory states that the universe is in a continuous expansion and there is no definitive end.
28. A phase in which some important vital processes occur to prepare the cell for division and the genetic material in the cell is doubled.
29. It is located in one of the spiral arms of the milky way galaxy.
- It contains all stars we see at night in the sky.
 - It's the Sun and eight planets revolving around it.
30. The phase in which chromosomes are arranged at the middle of the cell during its division.
- A phase in which chromosomes are arranged along the cell equator.
31. The speed when the body covers equal distances in different times.
32. The point of connection of the two chromatids together.
33. The change of the displacement relative to the time.
- The displacement covered per unit time. or: The rate of change of displacement.
34. Cells that are produced from meiosis division, contain half number of chromosomes.
35. A vision defect is resulted due to the formation of the image behind the retina of the eye.
- Seeing the far objects clearly and seeing the near objects distorted.
 - A vision defect results due to the decrease of the eye ball diameter.

36. A midpoint in the lens through which light ray passes without refraction.
37. Cellular division which leads to the formation of gametes.
- A type of cell division produces sperms and ova.
38. The part in the cell which is responsible for cellular division.
39. A type of lenses which is thick at the center and less thick at the tips.
40. Groups of stars that rotate together in cosmic space by the effect of the gravity.
- A huge number of stars arranged in a distinctive shape.
41. They are formed in living organisms as a result of the meiotic division.
42. The value of change of an object's speed in one second.
- The vector physical quantity whose measurement unit is m/sec^2 .
 - A physical quantity that represents change in the object speed in unit time.
43. The point of collection of the refracted light rays which is produced when the light rays fall parallel to the principal axis of a lens.
44. A process in which the fusion takes place between a male and female gamete to form a zygote.
- The combination of the male gamete (N) and female gamete (N) to form a zygote (2N).
45. Theory assumed that the solar system was originally a huge star (the Sun).
46. It contains the Sun and the solar system.
47. Seeing the near objects clearly and the far objects distorted.
48. The centre of the sphere that the mirror is considered a part of it.
49. One of the phases of mitosis in which a series of changes adverse to prophase occur.
50. A mirror used to form virtual, upright and magnified image for the object.
- The mirror, whose reflecting surface is a part of the inner surface the sphere.
51. The mass of cells that occurs when the body cells divide continually without control.
52. The process in which the living organism produces new individuals carry genetic traits identical to their parents.
53. It contains genetic material from each parent. When it grows, it gives a new offspring whose traits combine each parent's traits.
54. It represents the uniform speed by which the moving object moves to cover equal distances at the same periods of time.
55. Specialized cells which produce gametes.

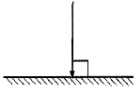


56. The force that controls the orbits of the planets around the sun according to the modern theory.
57. Fibers extend between the two poles of the cell in prophase.
58. A theory assumed that the solar system was originally a glowing gaseous sphere.
59. It is the point that lies in the middle of the reflecting surface of the mirror.
60. A process in which the fusion takes place between a male gamete and a female gamete to form a zygote.
61. A vision defect is due to the formation of the image in front of the retina of the eye.
62. A mirror whose reflecting surface is the outer surface of a hollow sphere.
- A mirror, always forms a diminished image for the object.
63. Glowing of a star for a short time to become one of the most shining stars in the sky.
64. A cell division occurs in the somatic cells and leads to the growth of the living organism.
65. A lateral bulge in the cell, when the cell nucleus is divided mitotically into two nucleoli, one of them immigrates to this bulge.
66. Theory states that the universe is in a continuous expansion and there is no definitive end.
67. A lens used to form a virtual, upright and always small image for the object.
68. The incident light ray and the reflected light ray and the normal all lie in the same plane perpendicular to the reflecting surface.
69. The angle between the reflected light ray and the normal line at the point of incidence on the reflecting surface.
70. The cell produced due to the fertilization and it contains the complete number of chromosomes of the living organism.
- It containing genetic materials from both parents and during growth it gives new individuals carries the traits of both parents.
71. Half the diameter of the sphere, where the face of the lens is a part of it.
72. A phase in which some processes occur which lead to the formation of a complete set of chromosomes that equal in numbers with the mother cells' chromosomes.
73. The scientists who established the crossing star theory about the evolution of the solar system.
74. They are very thin lenses made of plastic and can stick to the eye cornea by the eye fluid.
75. The result of multiplying the speed of a body with the time.
76. Change in the object position as time passes according to the position of another object.
77. Mathematical methods that physicists use to predict the relation between certain physical quantities.

78. The object that does not change its position as time passes.
79. The acceleration by which an object moves when its speed decreases with time.
80. A biological process, where living organisms produce new individuals of the same kind to ensure its continuity.
81. A transparent optical piece that is thin at its centre and more thickness at the tips.
82. Continuous separation among galaxies in the universe due to their regular motion.
83. An equipment was launched to the space, allows astronomers an opportunity to study the evolution of the universe.
84. It's a mirror that its reflecting surface is a part of a hallow sphere.
85. The result of multiplying half the speed of a body with double of the time.
86. A theory based on an astronomical phenomenon in which a star was glowing for a short time, and then its glowing disappears gradually.

② Put (✓) or (X), then Correct the underlined words in the wrong one:

- | | |
|--|-----|
| 1. The object moves with <u>increasing</u> speed when it covers equal distances at equal periods of time. | () |
| 2. The distance of the object from the plane mirror is <u>more than</u> the distance of its image from the mirror. | () |
| 3. <u>The focus</u> is point inside the lens lies on the principal axis. | () |
| 4. The scientist who established the modem theory of the origin of solar system is <u>Laplace</u> . | () |
| 5. The crossing over phenomenon occurs at the end of the <u>metaphase II</u> . | () |
| 6. Paramecium reproduces asexually by <u>budding</u> . | () |
| 7. Each galaxy has a distinctive shape according to the harmony and order of the groups of <u>planets</u> in it. | () |
| 8. The contact lenses can stick to the eye <u>iris</u> and can be removed easily. | () |
| 9. The <u>compass</u> is used to identify the speed of the car directly. | () |
| 10. In the plant cell, the spindle fibers are formed from the <u>cytoplasm</u> . | () |
| 11. The lens is a transparent medium that <u>reflects</u> the light and it is confined with two spherical surfaces . | () |
| 12. The relative speed of a moving object relative to an observer moves in the same direction equals the <u>sum</u> of the two velocities. | () |
| 13. The mass is a <u>scalar</u> physical quantity and their measuring unit is kilogram . | () |
| 14. The universe is formed from merging of atomic particles producing gaseous cloud of <u>helium and hydrogen</u> . | () |
| 15. Meiosis occurs in flowering plants in the <u>anther</u> to produce pollen grains. | () |
| 16. The <u>nebula</u> is a glowing gaseous sphere revolving around itself. | () |
| 17. When the body is put in front of a plane mirror its image will be <u>real, inverted</u> and equal. | () |

18. Andromeda galaxy includes the Sun and the solar system. ()
19. Force is from the vector physical quantities. ()
20. Some plants reproduce vegetatively by the seeds. ()
21. The measuring unit of distance is m/s. ()
22. If a person stands at a distance 3 m from a plane mirror, so the distance between the person and his image is 6 m. ()
23. When a body moves at acceleration - 3 m/s^2 , this mean that its initial speed is less than its final speed. ()
24. Gametes is the point of connection of the two chromatids of chromosome. ()
25. The galaxies is the distance covered by light in one year. ()
26. The meiosis division happens in cells of the bones. ()
27. The light ray falls on a mirror passing with its center of curvature is reflected passing through the focus. ()
28. The unit for measuring distances between galaxies is killometer. ()
29. The scientist chamberlain put the modem theory about evolution of the solar system. ()
30. When a moving body covers equal distances in equal intervals of time, it is said that it is moving with uniform acceleration. ()
31. The incident light ray parallel to the principal axis exits from the lens passing through the optical center of the lens. ()
32. Euglena reproduces asexually by binary fission. ()
33. The Earth rotates in a fixed orbit due to the effect of the Earth's gravity. ()
34. The chromosome chemically consists of DNA and fats. ()
35. The scientist Laplace published a research entitled. "world order". ()
36. The focus is the point that lies in the middle of the reflecting surface of the mirror. ()
37. The yeast fungus reproduces asexually by binary fission. ()
38. The incident light ray on a plane mirror with an angle equals 30° , it reflects with an angle equals 60° . ()
39. Relative speed is the actual length of the path that a moving object takes from the starting point of movement to the end point. ()
40. A spherical mirror where its radius is (12 cm.), its focal length equals to (6 cm.) from its pole. ()
41. A light ray that falls on a plane mirror as in the figure, it reflects where the angle of reflection equals 90° . ()
- 
42. The ability of some animals to compensate their missing parts is called budding reproduction. ()
43. The incident light ray parallel to the principal axis of a concave mirror is reflected passing by the focus of the mirror. ()
44. The bread mould fungus reproduces asexually by binary fission. ()
45. Pilots take in consideration the uniform speed of the wind. ()
46. Somatic cells are divided by meiosis division which leads to the growth of living organisms. ()

47. The image which is formed by a plane mirror is real. ()
48. The acceleration of a moving body with regular speed = zero. ()
49. If the number of chromosomes in liver cells of a living organism is (32), so the number of chromosomes in its reproductive cells is 16 pairs chromosomes. ()
50. The crossing over phenomenon occurs at the end of prophase from the meiosis division 1. ()
51. The nucleoli disappears during the mitosis cell division in telophase. ()
52. The (speed - time) graph for regular motion at constant (uniform) speed is represented by a straight line parallel to the time axis. ()
53. The yeast fungus reproduces asexually by regeneration. ()
54. The time is a scalar physical quantity. ()
55. Radius of mirror curvature is more than its focal length. ()
56. Chromosomes arranged a long cell equator in the metaphase. ()
57. The measuring unit of velocity is meter x second. ()
58. The optical center is a point inside the lens, the principal axis passes through it. ()
59. The focal length of a mirror = 2 x radius of curvature of the mirror. ()
60. If a car moves at a uniform speed of 72 km/h, this means that its speed equals 259.2 m/sec. ()
61. When the object is at a distance greater than the radius of curvature of a concave mirror the image is real , inverted and diminished. ()
62. If two cars moving in the same direction at the same speed equal 120 m/sec., so the relative speed equal 60 m/sec. ()
63. The Sun takes about 250 million years to complete one rotation around the center of the galaxy. ()
64. The number of chromosomes in somatic cells is (2N) and gametes is (N). ()
65. Short-sightedness is due to the elongation in the ball of the eye and the increase in convexity of the surface of the eye lens. ()
66. The long-sightedness is corrected by using a concave lenses. ()
67. Correcting the short-sightedness is done by using convex mirror. ()
68. Reproduction by regeneration occurs in unicellular living organisms. ()
69. The image formed by the concave lens is always real, inverted image. ()
70. Hydra is from unicellular living organisms that reproduces by budding. ()
71. A moving car with regular speed covers 500 m in 25 sec., so its speed equals 20 m/sec . ()
72. A moving car covers 180 km in two hours, then its speed is 50 m/s . ()
73. In Telophase of mitosis cell division, two new separate cells are formed, each cell has half number of chromosomes of mother cell. ()
74. Concave lens diverges the light rays that falling on its surface. ()
75. Sudden violent chemical reactions occur within the star which led to its explosion. ()
76. A moving car covers a distance of (200 kilometer) through (150 min.), then its speed is 80 km/h. ()

77. The ratio of number of cells produced due to the 3rd division to number of cells produced due the 2nd division equals 8:4. ()
78. Concave mirror is a transparent medium that refracts the light and is limited with two spherical surfaces. ()
79. If the object's speed decreases by time, it is called acceleration.
80. The word ambulance is written on ambulance cars minimized.

③ Complete the following with suitable words :

1. The Sun and the surrounding planets revolve around the centre of galaxy.
2. Mitosis occurs in the cells of living organisms.
3. Distance is a physical quantity, while force is a physical quantity.
4. The scientist who established the modern theory about the evolution of the solar system is
5. The distance that a moving object covers within a unit time is known as
6. The incident light ray which is parallel to the principal axis of a concave mirror reflects passing through
7. The founder of the modern theory is the scientist
8. The scientists believe that the matter of the universe was a ball of high pressure and high temperature.
9. The atomic particles fused and formed gas and gas, which formed the galaxies, stars, and universe.
10. The long-sighted person needs glasses of lens.
11. Vegetative reproduction in plants happens by division.
12. Vector velocity = $\frac{\text{.....}}{\text{Total time}}$
13. scientist who founder the nebular theory.
14. The spindle fibers are formed during the cell division in
15. are formed of groups of stars in the universe.
16. If a beam of parallel rays fall on the concave lens, and they parallel to the principal axis, so the rays pass through the concave lens as if they come from a point the lens.
17. The scientist established his theory about the origin of the solar system on the basis of stars explosion phenomenon.

18. image is the image that can be received on a screen .
19. Meiotic division occurs in the anther of the flower to form male
20. Convex lenses are used to treat some vision defects as
21. The average speed represents the speed by which the object moves to cover equal distances at the same period of time.
22. The acceleration of an object increases if its speed as time passes.
23. The incident light ray that is parallel to the principal axis of a convex lens, it exits
24. The image formed by the concave lens is always
25. Chromosomes pairs arrange on the cell's equator in the
26. The increasing uniform acceleration means that the speed of the body changes with values through
27. The secondary axis of the spherical mirror is any straight line that passes by and any point on its surface except
28. The somatic cells are divided by division, while the reproductive cells are divided by division.
29. Within minutes of the Big Bang, the atomic particles merged together producing and gases.
30. Starfish reproduces asexually by
31. Measuring the relative speed depends on the position of the who determines the magnitude of this speed.
32. An object starts its motion from rest till its acceleration reaches 2 m/s^2 after 2 seconds, the final speed by which it moves equals m/s.
33. The length of the shortest straight line between two positions is called
34. Galaxies gather in groups called
35. The image that cannot be formed on a screen is a image.
36. In flowering plants, meiotic division occurs in the anther to produce
37. The crossing over happens during the of the division.
38. The image formed by the lens is always virtual, upright and smaller than the object.
39. Astronomers use special equipment to study the Sun, this equipment is the

40. Romans used a huge optical piece to burn the sails of enemies' ships by using sun rays. What is the suitable optical piece to do this action ?
41. Nano-molecules of metal is used to detect cells of cancer and rays are used to destroy them.
42. A moving car in a direction at a speed 70 km/h, its relative speed equals 130 km/h, related to a moving observer at a speed equals in direction to the moving car.
43. The two factors which can be used to describe the motion of a body are and
44. The normal person can see clearly the far objects at a distance up to
45. If a beam of parallel rays fall on the concave lens, and they parallel to the principal axis, so the rays pass through the concave lens as if they come from a point the lens.
46. Asexual reproduction by spore propagation in fungi and algae occurs by producing
47. The radius of the thin lens is that of the thick lens.
48. According to modern theory the gaseous cloud subjected to and processes forming the matter of planets.
49. The two gases which formed the universe's matter are helium and hydrogen with a percentage of 25% to
50. The spherical mirror has one principal axis and uncountable number of axes.
51. When an object is placed at of a convex lens, no image is formed.
52. From speed measurement units are or
53. The Egyptian scientist Dr. Mustafa El-Said discovered a way to detect the cancer cells by using
54. When the body moves with accelerating motion (increasing acceleration), it means that its speed is more than its speed.
55. The incident light ray that falls on a concave mirror passing through the focus, it reflects , while the incident light ray that passes through the centre of curvature of the mirror, it reflects
56. The density is considered as physical quantity, while the force is considered as physical quantity.
57. As the distance between the planet and the Sun increases, the Sun's gravitational force and its movement around the Sun becomes
58. If a car moves at a speed 50 km/h and it seems to an observer at a speed 110 km/h, therefore the speed of the moving observer is km/h and in the direction of the car's motion.

59. The Sun was born after million years from the Big Bang.
60. The quantity that its magnitude only is necessary for identifying it is called quantity.
62. The concave lens the rays fall on it.
63. If the body moves from rest, so its initial speed equals
64. The source of genetic variation is the reproduction.
65. Convex mirror, its reflecting surface is a part of the of the sphere.
66. The convex lens is used in the treatment of
67. Condensing the cytoplasm in the two poles of the plant cells forms
68. In human and animals, meiosis occurs in to produce the male gametes, while it occurs in to produce the female gametes.
69. The chemical structure of the chromosome is and
70. The result of dividing the total distance over the total time to cover it is equal and it is equal if the object moves by it. The object covers the same distance in the same time.
71. The Big Bang theory explain the origin of , while the nebular theory is one of the theories which explain the origin of.
72. In animal cell spindle fibers formed from , while in plant cell spindle fibers form at the poles.
73. The product of the velocity of moving body x the time equal
74. The image formed by concave lens is always erect and diminished.
75. The nucleolus and nuclear membrane disappear at the end of of mitosis.
76. The contact lenses are used instead of the and it is made of
77. The convex lens the light, while the convex mirror the light.
78. The cell contains the genetic material of the living organism which consists of a number of
79. Galaxies began to form after years after the Big Bang.
80. From the examples of the multicellular organisms reproduced by budding is
81. reproduction doesn't required neither special systems nor structures in the living organisms.

82. A concave mirror has a focal length of 20 cm , then the radius of curvature of its spherical surface equals

83. The telescope is from the space telescopes.

84. The distance between the focus of the concave mirror and its pole is called

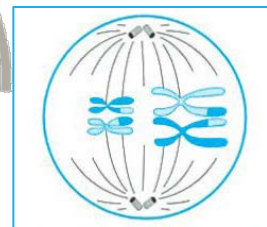
④ Explain by drawing

1. The properties of the image formed by a convex lens when an object is placed between the focus and double of the focal length.

2. The opposite figure represents one of meiotic division (meiosis) phases :

a. What is the name of this phase ?

b. Draw the phase next to this phase.



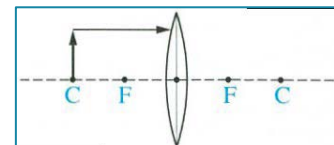
3. Compare with drawing only between:

The image which is formed when the object is placed at a distance less than the focal length of both of : Concave mirror and Convex lens.

4. Metaphase in first meiotic division and second meiotic division.

5. Copy the opposite figure in your answer paper, then draw:

the direction of rays which form the image of the object. And mention the properties of the formed image.



6. A body is placed at 8 cm from a surface of a convex lens is made of two surfaces of spheres, the diameter of each sphere is 16 cm , show by drawing the distance between the object and its image and calculate this distance. Write the properties of the image.

7. An object is placed at a distance of 8 cm from the pole of a mirror, a real and enlarged image was formed and when the object moves 2 cm away from the mirror, a real and equal image to the object was formed.

1. What is the type of the mirror ?

2. Calculate the radius of the mirror curvature.

3. Show by drawing the path of the rays forming the image in the first situation.

8. Show by drawing anaphase in mitotic division and explain what happens in this phase ?

9. Show by drawing only : The metaphase of mitotic cell division.

10. A concave mirror with a focal length of 5 cm and an object is placed at a distance of 3 cm. from the mirror. Determine the position of the formed image and its characteristics by drawing the direction of rays.

11. The following table shows the relation between the speed of a moving body and the time :

Speed (m/s)	5	10	20	30	35	40
Time (sec.)	1	2	4	6	7	8

a. Draw the graphical relation between (V) on Y-axis and (t) on X-axis.

b. From the graph find:

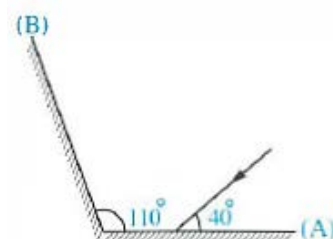
(1) The speed of the body after a time of 5 sec.

(2) The acceleration of the body.

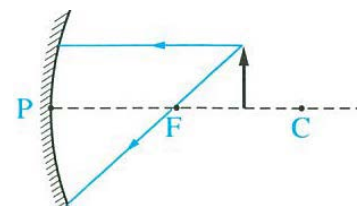
12. In the opposite figure :

A light ray falls on a plane mirror (A) and reflects from it towards a plane mirror (B).

Draw this shape in your answer sheet, then find the angle of reflection of this ray from mirror (B) and draw the path of rays on the mirror (B).



13. Draw the opposite figure in your answer sheet, then determine the position of the formed image and its properties by drawing two light rays only.

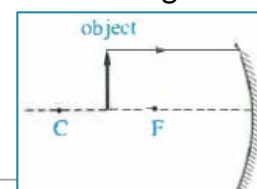


14. If a car starts moving from rest (speed = zero) and after one second its speed becomes 2 m/sec. after another second, its speed increases to 5 m/sec. then, the motorist had to use the brakes to slow down the car's speed to 1 m/sec. in the third second and he stops completely after another second.

Represent graphically (draw a graph) in graphic paper sheet for the graphic relationship (speed-time) of this moving car.

15. An object was placed at a distance of 5 cm from a convex lens, its focal length is 2 cm. Show by drawing the direction of rays and illustrate the properties of the formed image.

16. Redraw the opposite figure in your answer paper, then complete it to form the image and write the properties of the formed image and its position.



17. Draw the figure in your answer paper, then complete it to obtain a virtual, smaller and erect image to the object (A).



18. An object is placed at a distance of 30 cm from a concave mirror with a radius of curvature 40 cm.

a. Calculate the focal length of the mirror.

b. Show by drawing the path of rays that show the formed image in this case.

19. Show by drawing what happen in anaphase 1 for meiosis division.

20. An object is put at a distance of 4 cm. from the optical centre of a lens a (real - magnified) image is formed for the object and when the object moved a distance of 2 cm away from the lens a (real-equal to the object) image is formed.

a. What is the kind of the lens ?

b. Draw the path of the rays that formed the image when the object was at a distance of 4 cm from the optical centre of the lens ?

21. In a race, a runner moves at a regular speed of 10 m/sec. from the start of the race to the fifth second and there was a car that moves beside him, the speed of the car increases from zero to 25 m/sec. in 5 seconds also.

(a) Draw a graph (speed - time) and record on it.

(1) the movement of the runner.

(2) the movement of the car.

(b) Use the previous graph to calculate :

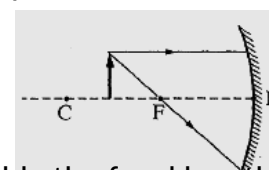
(1) the distance covered by the runner.

(2) the time in which the speed of the runner is equal to the speed of the car.

22. Show by drawing the pass and the directions of rays to an object in front of a concave mirror at a distance greater than double focal length, knowing that its focal length is 0.025 m with determine the properties of the formed image.

23. Show by drawing only the formation of a virtual, upright and magnified image by using the spherical mirror.

24. Complete the light rays to form the image of the object. And mention the properties of the formed image?



25. Explain by drawing :

The formed image by convex lens, when the body at a distance greater than double the focal length. Then write the properties of the formed image.

⑤ Give reasons for the following:

1. A convex mirror is placed at the left and the right sides of the driver of the car.
2. The galaxy which the Earth planet belongs is called Milky Way galaxy.
3. Pilots take in consideration the velocity of the wind.
4. Binary fission is considered as mitosis.
5. The constancy of the planets in their orbits around the Sun.
6. The body moves by acceleration can't move with regular (constant) speed.
7. The zygote contains the complete genetic material.
8. The object that is placed at the focus of a convex lens has not an image.
9. The sexual reproduction is the source of genetic variation.
10. Explosion of some stars suddenly.
11. The velocity is a vector physical quantity.
12. The continuous expansion of the space.
13. The mitotic division is more importance for children than meiotic division.
14. The long-sightedness is treated by using a convex lens.
15. Shrinking of spindle fibers during the anaphase of mitosis.
16. Asexual reproduction produces offspring identical to those of their parents.
17. The nebula lost its sphere form and became in a form of a flat rotating disk.
18. The uniform speed of a car cannot be obtained practically.
19. The distance is a scalar physical quantity.
20. Each galaxy in the universe has a distinctive shape.
- 21. The object that is placed at the focus of a convex lens does not form an image.**
22. Galaxies move away from each other.
23. The focal length of the thick convex lens is less than that of the thin convex lens.
24. The meiotic division is called the reduction division.
25. The lens has two foci, while the spherical mirror has one focus.
26. Sexual reproduction depends on meiotic division.
27. The lens has two centres of curvature [C_1 & C_2].
28. Importance of speedometers in cars and planes.
29. The word AMBULANCE is written in laterally inverted way on the ambulance car.
30. Cellular division begins with interphase.
31. The infection of the eye with the cataract.
32. Binary fission is considered as mitosis.
33. The metro or train motion is considered from examples of motion in one direction.



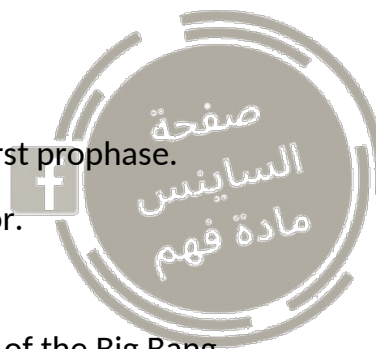
34. Distances of the galaxies away from each other.
35. The lens has two centres of curvature, while the spherical mirror has only one centre of curvature.
36. Asexual reproduction in living organisms produces individuals identical in genetic structure with the original organism.
37. The distances between the celestial bodies are measured in light year.
38. When the object is placed at the focus of a convex lens, the image is formed at the infinity.
- The formed image by the convex mirror is always virtual.
39. The focal length of a concave mirror can be determined by knowing its radius of curvature.
40. The zygote contains the complete genetic material.
41. The sporangium of bread mould fungus must be ruptured during reproduction.
42. The merging of atomic particles that happened during the Big Bang produced stars and the universe.
43. Meiotic cell division is called reduction division.
44. A donor for a part of the liver suffers no harm and can survive.
45. When you look at the mirror you see your face image.
46. There are no new species of grapes when they reproduce by vegetative reproduction.
- There are no new races (new individual with other trait) of plants, when they reproduce by vegetative reproduction.
47. The Sun escaped from the gravity of the huge star in the crossing star theory.
48. The number of chromosomes is constant in the same species which reproduce sexually.
49. The perpendicular incident light ray on plane mirror reflects on itself.
50. The technic of discovering the cancer cells by using the Nano-molecules of gold depend on using special protein.



⑥ What would happen in the following cases ... ?

1. The diameter of the eyeball becomes shorter than a certain length (according to : the position of the formed image).
2. Crossing over phenomenon doesn't occur.
3. Putting a yeast fungus in a warm sugary solution.
4. A plane mirror is put on the left side of the driver of the car instead of a convex mirror.
5. The gravity between the Sun and the planets which rotate around is vanished.

6. A light ray passes through the optical centre of the concave lens.
7. The nebula lost its temperature in Laplace's opinion.
8. Incidence of a beam of light rays parallel to the principal axis of a concave lens.
9. The eye lens surface in man is less convex.
10. A body is placed in front of a convex mirror.
11. The expanded part between the Sun and the crossing star explodes according to Chamberlain and Moulton.
12. The combination of male gamete and female gamete.
13. The parts of inner chromatids are exchanged in the first prophase.
14. A light ray is incident by an angle 35° on a plane mirror.
15. Starfish losses one of its arms.
16. The atomic particles merged together within minutes of the Big Bang.
17. Absence of centrosome in the animal cell.
18. When the initial speed for a moving object is greater than the final speed (according to its acceleration).
19. When the length of the eyeball diameter is larger than the normal.
20. Explosion of the expanded part from the Sun towards the crossing star.
21. A kind of living organisms stops reproduction process.
22. Incidence of a light ray passing through the centre of curvature of the concave mirror.
23. Meiotic division of reproductive cells occurs in human body.
24. A body is placed at a distance less than the focal length of a concave mirror.
25. No fusion occurs between male gamete and female gamete in the sexual reproduction.
26. **When the following cases happen ... ?**
 - a. The distance moved by the object equals its displacement.
 - b. Reflection of a light ray falls on a concave mirror to pass with its focus.
 - c. Formation of virtual, upright and diminished image behind the mirror.
27. The object speed changes by equal values through equal periods of time.
28. The gaseous cloud is cooled (in Alfred Hale theory about the evolution of the solar system).
29. An object moves at a uniform speed related to its acceleration.



30. The merge of the atomic particles together within minutes of the Big Bang.
31. Reproductive cells are divided by meiosis.
32. When an injured liver or cutting a part of it.
33. To the displacement of a moving body when it returns back to its starting point.
34. To the speed of a body if it covers the same distance in half the time.
35. When rupturing sporangium in bread mould fungus.
36. To the distance between the image and the plane mirror when the body becomes closer to the mirror.
37. A car driver press the brake for stopping after a certain time.
38. An object is put at the focus of a concave mirror.
39. The nucleus of the cell is removed.
40. The interphase before cell division does not occur.
41. An amoeba cell divides three mitotic divisions.
 - The Euglena cell divided by three successive mitosis divisions.
42. Cutting a part of a potato tuber and putting it in a suitable environment.
43. Absence of anther from the floral plants.
44. To the value of velocity of a moving object if the time of the same displacement is increased to double.
45. The organization and arrangements of stars in the galaxy were changed.
46. Focusing laser on the gold Nano-particles in the cells infected by cancer.
47. Elongation in the ball of the eye more than the normal situation.
48. If an object moves at a regular speed, what is the value of its acceleration ?
49. If the body cuts the same distance in half the time (to the speed of a body).
50. When the bread mold fungus falls on a suitable environment.



Good Luck

Answer Keys

① Write the scientific term :

- | | | |
|-----------------------------------|-----------------------------------|--|
| 1. Relative speed | 30. Metaphase | 59. Pole of the mirror |
| 2. Speed | 31. Irregular (non-uniform) speed | 60. Fertilization |
| 3. Interphase | 32. Centromere | 61. Short-sightedness |
| 4. Scalar physical quantity. | 33. Velocity | 62. Convex mirror |
| 5. Vector physical quantity. | 34. Gametes | 63. Star explosion phenomenon |
| 6. Universe | 35. Long-sightedness | 64. mitotic division |
| 7. lens | 36. Optical center | 65. Bud |
| 8. Amount of displacement | 37. meiosis (meotic) division | 66. Big bang |
| 9. Focus of mirror | 38. Nucleus | 67. Concave lens |
| 10. Vegetative reproduction | 39. Convex lens | 68. The second law of reflection |
| 11. Virtual image | 40. Galaxy | 69. Angle of reflection |
| 12. Nebula | 41. Gametes | 70. Zygote |
| 13. Secondary axis | 42. Acceleration | 71. The radius of curvature |
| 14. average speed | 43. Focus | 72. Telophase |
| 15. Regeneration | 44. Fertilization | 73. Chamberlain and moulton |
| 16. Principle axis | 45. Crossing star theory | 74. Contact lens |
| 17. DNA | 46. Milky way galaxy | 75. Distance |
| 18. gravitational force (gravity) | 47. Short-sightedness | 76. Motion |
| 19. Chromosomes | 48. Center of curvature | 77. Tables and graphs |
| 20. Plane mirror | 49. Telophase | 78. Static object |
| 21. Sun | 50. Concave mirror | 79. Negative acceleration
(decelerating motion) |
| 22. Light reflection | 51. Tumor | 80. Reproduction |
| 23. The crossing over phenomenon | 52. Asexual reproduction | 81. Concave lens |
| 24. Cataract | 53. Zygote | 82. Expansion of the universe |
| 25. First law of reflection | 54. Uniform acceleration | 83. Hubble telescope |
| 26. Light year | 55. Reproductive cell | 84. Spherical mirror |
| 27. Big bang | 56. The force of gravity | 85. Distance |
| 28. Interphase | 57. Spindle fibers | 86. Modern theory |
| 29. Solar system | 58. Nebular theory | 87. |


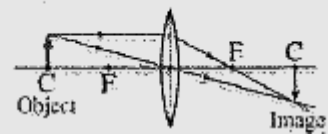
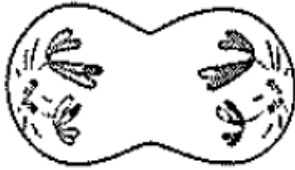
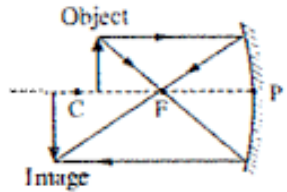
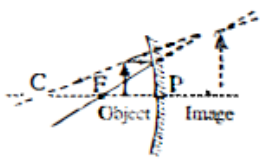
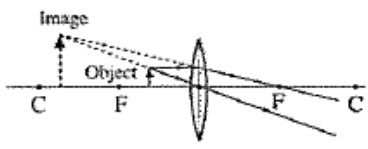
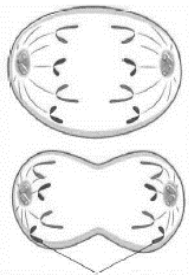
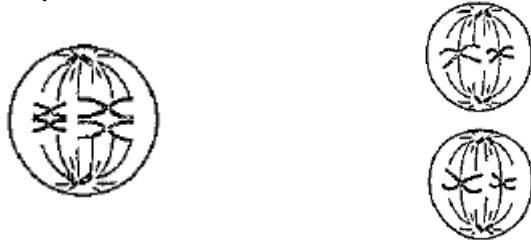


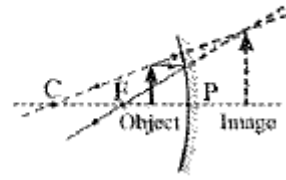
② Put (✓) or (X), then Correct the underlined words in the wrong one:

- | | | |
|--|--------------------------------|---|
| 1. (x) uniform / regular | 30. (x) uniform speed | 59. (x) $\frac{1}{2}$ |
| 2. (x) equal to | 31. (x) focus | 60. (x) 20 |
| 3. (x) optical center | 32. (✓) | 61. (✓) |
| 4. (x) Fred Hoyle | 33. (x) sun's | 62. (x) zero |
| 5. (x) prophase I | 34. (x) protein | 63. (x) 220 |
| 6. (x) binary fission | 35. (✓) | 64. (✓) |
| 7. (x) stars | 36. (x) pole | 65. (✓) |
| 8. (x) cornea | 37. (x) budding | 66. (x) convex lens |
| 9. (x) speedometer | 38. (x) 30° | 67. (x) concave lens |
| 10. (✓) | 39. (x) distance | 68. (x) binary fission |
| 11. (x) refracts | 40. (✓) | 69. (x) virtual, erect, diminished |
| 12. (x) difference | 41. (x) zero | 70. (x) yeast fungus |
| 13. (✓) | 42. (x) regeneration | 71. (✓) |
| 14. (✓) | 43. (✓) | 72. (x) 25 |
| 15. (✓) | 44. (x) spore propagation | 73. (x) equal |
| 16. (✓) | 45. (x) velocity and direction | 74. (✓) |
| 17. (x) virtual, upright (erect) | 46. (x) mitosis | 75. (x) nuclear |
| 18. (x) milky way | 47. (x) virtual | 76. (✓) |
| 19. (✓) | 48. (✓) | 77. (✓) |
| 20. (x) roots, stem (vegetative parts) | 49. (✓) | 78. (✓) |
| 21. (x) speed | 50. (✓) | 79. (x) deceleration/ negative acceleration |
| 22. (✓) | 51. (x) prophase | 80. (x) laterally inverted |
| 23. (x) more | 52. (✓) | |
| 24. (x) centromere | 53. (x) star fish | |
| 25. (x) light year | 54. (✓) | |
| 26. (x) ovary/testes | 55. (✓) | |
| 27. (x) on its self | 56. (✓) | |
| 28. (x) light year | 57. (x) meter/second | |
| 29. (x) Fred Hoyle | 58. (✓) | |

③ Complete the following with suitable words :

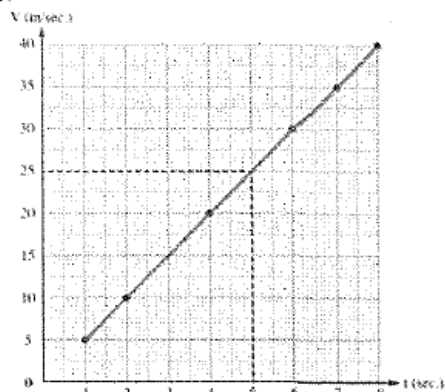
1. milky way	30. regenration	59. 10000
2. somatic	31. observer	60. scalar
3. scalar - vector	32. 4	62. diverge (separate)
4. Fred Hoyle	33. amount of displacement	63. zero
5. speed	34. clusters	64. sexual
6. focus	35. virtual	65. outer
7. Fred Hoyle	36. pollen grains	66. long-sightedness
8. gaseous	37. prophase I – first meiotic	67. spindle fibers
9. hydrogen – helium	38. concave	68. testes – ovaries
10. convex	39. solar telescope	69. DNA – protein
11. mitosis	40. concave mirror	70. average speed – regular speed
12. Total displacement	41. gold	71. the universe – the solar system
13. Laplace	42. 60 km/h – oppsite	72. centrosome – condensing of the cytoplasm
14. prophase	43. distance – time	73. displacement
15. glaxies	44. 6 m	74. virtual
16. diverging – in front of	45. diverging – in front of	75. prophase
17. Fred Hoyle	46. spores	76. glass – transparent plastic
18. real	47. longer than	77. converge – diverge
19. gamete (pollen grains)	48. cooling – contraction	78. nucleus – chromosomes
20. long-sightedness	49. 75 %	79. 3000 million
21. regular	50. secondary	80. hydra
22. increases	51. the focus	81. asexual
23. passing through focus	52. m/sec – km/h	82. 40 cm
24. virtual, erect, diminshed	53. molecules of gold	83. hubbel
25. metaphase	54. final – intial	84. focal length
26. equal – equal period of time	55. parallel to the principal axis – on its itself	
27. center of curvature – pole	56. scalar – vector	
28. mitotic(mitosis) – meiotic (meiosis)	57. decrease – slower	
29. H - He	58. 60 - opposite	

④ Explain by drawing

<p>1. * The drawing :</p>  <p>* The properties of the formed image : Real, inverted and magnified.</p>	<p>6. * The drawing :</p>  <p>* the distance between the object and its image = 16 cm * the properties of the formed image: Real – inverted – equal to the object.</p>
<p>2. a. Metaphase I b. Anaphase I</p>  <p>Anaphase I</p>	<p>7. 1. Concave mirror. 2. The radius = 10 cm.</p> 
<p>3. • The concave mirror :</p>  <p>• The convex lens :</p> 	<p>8. In this phase :</p> <ul style="list-style-type: none"> - The centromere of each chromosome splits lengthwise into two halves, so the chromatids separate from each other. - Spindle fibers begin to shrink and two identical groups of chromosomes (each contains single chromatid) are formed. - Each group of chromosomes migrate towards one of the cell's poles.  <p>Chromosomes contain single chromatid Anaphase</p>
<p>4. Metaphase in first meiotic division:</p>  <p>Metaphase in second meiotic division:</p> 	<p>9. same answer number (4)</p>
<p>5. * The drawing :</p>  <p>* The properties of the formed image : – Real, inverted and equal to the object.</p>	<p>10. * The drawing :</p>  <p>* The position of the formed image: Behind the mirror. * The characteristics of the formed image: Virtual – Upright (erect) – Magnified.</p>

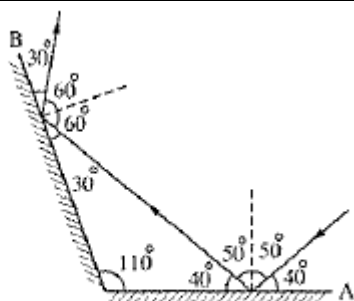
11.

1.

2. (1) $V = 25 \text{ m/sec}$.

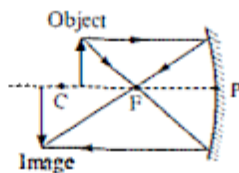
$$(2) a = \frac{\Delta V}{\Delta t} = \frac{40 - 0}{8 - 0} = 5 \text{ m/sec}^2$$

12.

Angle of reflection = 60°

13.

* The drawing :

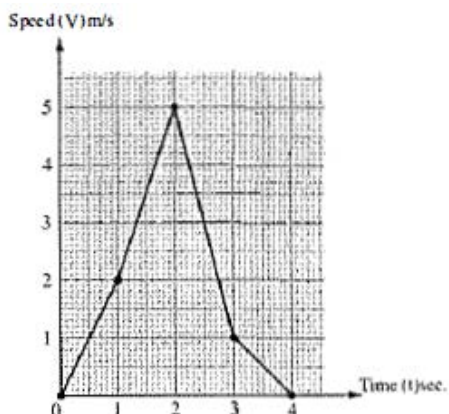


* The position of the image: At a distance greater than the radius of curvature.

* The properties of the image:

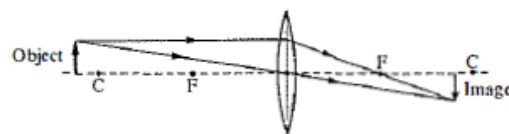
Real - Inverted - Magnified.

14.



15.

* The drawing :

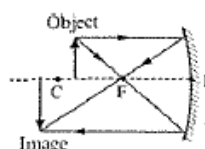


* The properties of the formed image:

Real - Inverted - Diminished.

16.

* The drawing :



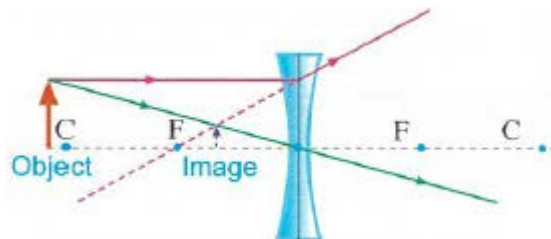
* The position of the image:

After the center of curvature (at distance greater than the radius of curvature)

* * The properties of formed the image:

Real - Inverted - Magnified.

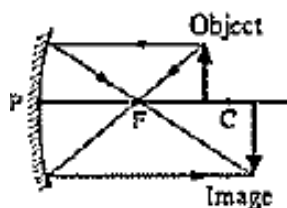
17.



18.

$$1. \text{ Focal length} = \frac{r}{2} = \frac{40}{2} = 20 \text{ cm}$$

2.



19. The spindle fiber shrinks so every two homologous chromosomes move away from each other.

One of the two chromosomes migrates toward the cell pole and the other migrates toward the other pole.

Therefore each pole contains half the number of chromosomes of the parent cell.



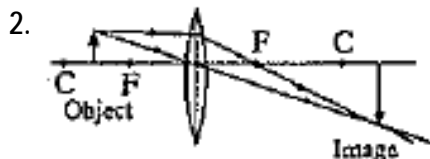
23.

* The drawing :

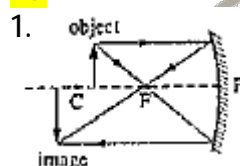


20.

1. Convex lens.

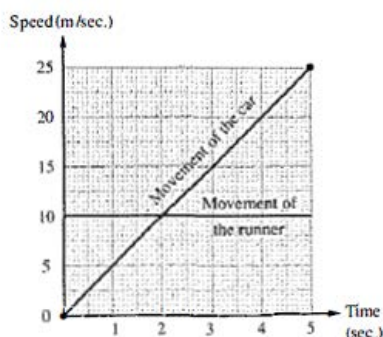


24.



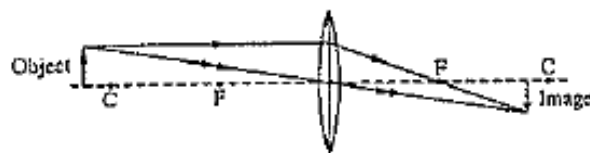
2. The properties of the formed image :
real, inverted and magnified.

21. (a)



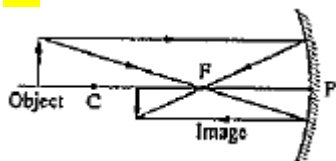
(b) (1) $d = v \times t = 10 \times 5 = 50 \text{ m}$. (2) 2 sec.

25.



The properties of the formed image :
- real, inverted and diminished,

22.



The properties of the formed image :
real, inverted and diminished.

⑤ Give reasons for the following:

1. Because it forms an erect and smaller image for the way behind the car.
2. Because it appears in the sky at night as a splashing milk or spreading straw.
3. Because the direction of the wind affects the velocity of the plane and hence the time of the trip and the amount of the fuel consumed.
4. Because two identical cells are produced, each one is identical to the original cell.
5. Due to the Sun gravity.
6. Because the body which moves with acceleration, its speed changes by passing time.

7. Because it is produced from the combination of a male gamete and a female gamete, each of them contains half number of chromosomes of the parental organism.
8. Because the penetrating rays from a lens don't meet and pass through a parallel way at infinity.
9. Due to occurrence of crossing over phenomenon during the formation of gametes through the meiotic division and also the offspring resulting from sexual reproduction combines the genetic traits from two sources.
10. Due to occurrence of suddenly nuclear reactions.
11. Because it is identified by its magnitude and direction.
12. Due to the movement of the galaxies apart.
13. Because mitosis plays an important role in growth which the body of children needs, while meiosis aims to the production of gametes in adults only.
14. Because the convex lens collects the rays, so the image of the object is formed on the retina.
15. To form two identical groups of chromosomes at each pole of the cell.
16. Because it occurs through one parental individual and through a mitotic division as the new individual gets a genetic copy identical to the parent.
17. Due to the effect of centrifugal force that is resulted from the rotation of the nebula around itself.
18. Because the car speed changes according to the conditions of the road and the traffics.
19. Because it is identified by magnitude only.
20. According to the harmony and the order of the groups of stars in it.
21. Because the penetrating rays from a lens don't meet and pass through a parallel way at infinity. مكرر
22. As a result of their regular movement.
23. Because the radius of the thin lens is bigger than that of the thick lens.
24. Because the produced cells contain half the number of chromosomes of the original cell.
25. Because the lens has two circular surfaces, but the mirror has one circular surface.
26. Because by meiotic division, the gametes are formed which are required to complete the sexual reproduction.
27. Because the lens has two circular surfaces. each surface has a centre of curvature.
28. To help us in identifying the speed of cars and planes directly.
29. In order to appear in the minors of the cars in front of the ambulance car written in a correct way and can be read by the drivers.
30. To prepare the cell for division through some important biological processes where the amount of genetic material duplicates.
31. Due to the following reasons : • Old age. • Illness. • Side effects of drugs. • Genetic re adiness.
32. Because two identical cells are produced, each one is identical to the original cell. مكرر
33. Because they move forward or backward in a straight path or curved path or combination of both.

34. As a result of their regular movement.
35. Because the lens has two circular surfaces, each surface has a centre of curvature but the spherical mirror has one circular surface only.
36. Because it occurs through one parental individual and through a mitotic division as the new individual gets a genetic copy identical to the parent.
37. Because the distance between stars are very large.
38. As the rays refract parallel to each other. so their extensions cannot be intersected, so the image is formed at the infinity.
39. Because focal length = $\frac{1}{2}$ x radius of curvature.
40. Because it is produced from the combination of a male gamete and a female gamete, each of them contains half number of chromosomes of the parental organism.
41. To release the spores and fall on suitable environment to start growing and produce new organism.
42. Due to the formation of hydrogen and helium gasses.
43. Because it reduces the number of chromosomes to the half in each one of the produced cells (gametes).
44. Because liver cells divide by mitosis to compensate the damaged part.
45. Due to light reflection.
46. Because the new offspring gets a full copy of the parental individual's genetic traits.
47. Due to the explosion in the expanded part of the Sun that faces the huge star.
48. Because each of male gamete and female gamete contains half number of chromosomes (N), by combination, a zygote containing the whole number of chromosomes (2N) is formed.
49. Because the angle of incidence = the angle of reflection = zero.
50. Because the protein molecules have the ability to adhere to the secretion on the surface of the cancer cells.



⑥ What would happen in the following cases ... ?

1. The image is formed behind the retina.
2. No variation of genetic traits among the members of the same species takes place.
3. The yeast fungus reproduces asexually by budding forming a new fungus separated from the parent cell or it remains connected to the parent cell forming a colony.
4. An equal image for the way is formed, so the driver doesn't see the way.
5. The planets will leave their orbits and float randomly in the cosmic space and therefore there will be no solar system.
6. It passes through the lens without refraction.
7. Its size contracted and its revolving speed around itself increased.
8. The parallel rays pass through the concave lens and are diverged and their extensions are collected in a virtual focus of the lens.

9. He can see far objects only clearly but close objects are not seen clearly.
(or) he suffers from long sightedness and image of near object is formed behind the retina).
10. A virtual, erect and diminished image is formed.
11. The Sun escaped from the gravity of the crossing star and a gaseous line was formed from the Sun until the last planets.
12. A zygote is produced and when it grows, it gives a new offspring with traits of its parents.
13. Crossing over phenomenon occurs.
14. It reflects by an angle equals 35° .
15. The missing part can grow forming a complete animal if it contains a part of the central disc.
16. Formation of gaseous clouds of hydrogen and helium with a percentage of 75% : 25% respectively which are produced galaxies, stars and universe over millions of years.
17. The spindle fibers are not formed, then the cell doesn't divide.
18. The object moves with a decelerating motion (a negative acceleration).
19. This causes the retina to be far from the eye lens and this causes short-sightedness.
20. The Sun escaped from the gravity of the crossing star and a gaseous line was formed from the Sun until the last planets.
21. This living organism will not produce new individuals of the same kind which causes the extinction of this living organism.
22. It reflects on itself.
23. The gametes will be produced which contain the half number of chromosomes.
24. A virtual, erect and magnified image is formed behind the mirror.
25. The zygote will not be formed.
26. a. When the object moves in a straight line in one direction.
b. When this light ray falls parallel to the principal axis of the mirror.
c. When the object is placed in front of a convex mirror.
27. The object moves at a uniform acceleration.
28. It contracts and forms the planets.
29. The acceleration equals zero.
30. Formation of gaseous clouds of hydrogen and helium with a percentage of 75% : 25% respectively which produced galaxies, stars and universe over millions of years.
31. They will produce gametes that contain the half number of chromosomes.
32. The remaining cells undergo many mitotic divisions to compensate the missing part.
33. It will be equal to zero.
34. The speed increases to its double value.

35. A large number of spores are released.
36. When the body moves close to the mirror, the image will move close to the mirror also to make the distance between the image and the mirror = the distance between the object and the mirror.
37. The final speed of the car = zero and the acceleration of its movement is a deceleration .
38. No image is formed.
39. The cell division doesn't occur.
40. The genetic material will not be duplicated and each cell from resulting cells doesn't obtain a complete copy of genetic material.
41. The parental cell disappears and 8 identical cells are produced.
42. It grows forming a new plant.
43. Pollen grain do not formed and the sexual reproduction does not take place.
44. The speed of the moving object decreased to the half.
45. The shape of galaxy is changed.
46. The gold molecules absorb light energy and change it to heat leading to burn and kill the cancer cells.
47. Causes short-sightedness.
48. Acceleration= zero.
49. the speed increases to its double.
50. Start growing to give out a new organism.



Best wishes